FIVE KEY REASONS WHY ENERGY EFFICIENCY IS MICHIGAN'S FIRST PRIORITY ENERGY RESOURCE*

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by
Martin Kushler, Ph.D.
Senior Fellow
American Council for an Energy-Efficient Economy
mgkushler@aceee.org 517 655-7037

* ["Energy efficiency is the best example of a no-regrets policy Michigan can have" Governor Rick Snyder, November 28, 2012]

TOPICS

- Q #2: Cost-effectiveness of energy efficiency
  - Michigan's dollar drain for imported energy
  - Energy efficiency as a utility system resource
- Q #10: Remaining energy efficiency potential
  - Michigan's older building stock
  - Recent data on existing buildings and equipment

PROVOCATIVE ASSERTION

It is arguably the case that high energy costs, and Michigan's huge energy import dependence,

….are the single biggest factors explaining Michigan's tough economic times since 2000.

KEY POINT #1: MICHIGAN HAS A HUGE ENERGY PROBLEM

- Michigan uses a lot of energy
  - Total cost $22 billion per year in 2000

    By2010, had increased to over $31 billion!!!
  - 9th highest cost burden in the nation

- **Michigan is almost totally dependent on fuels imported from other states and countries**

  We import:
  - 100% of the coal and uranium we use
  - 96% of oil & petroleum products
  - 80% of the natural gas

Source: U.S. Energy Information Administration

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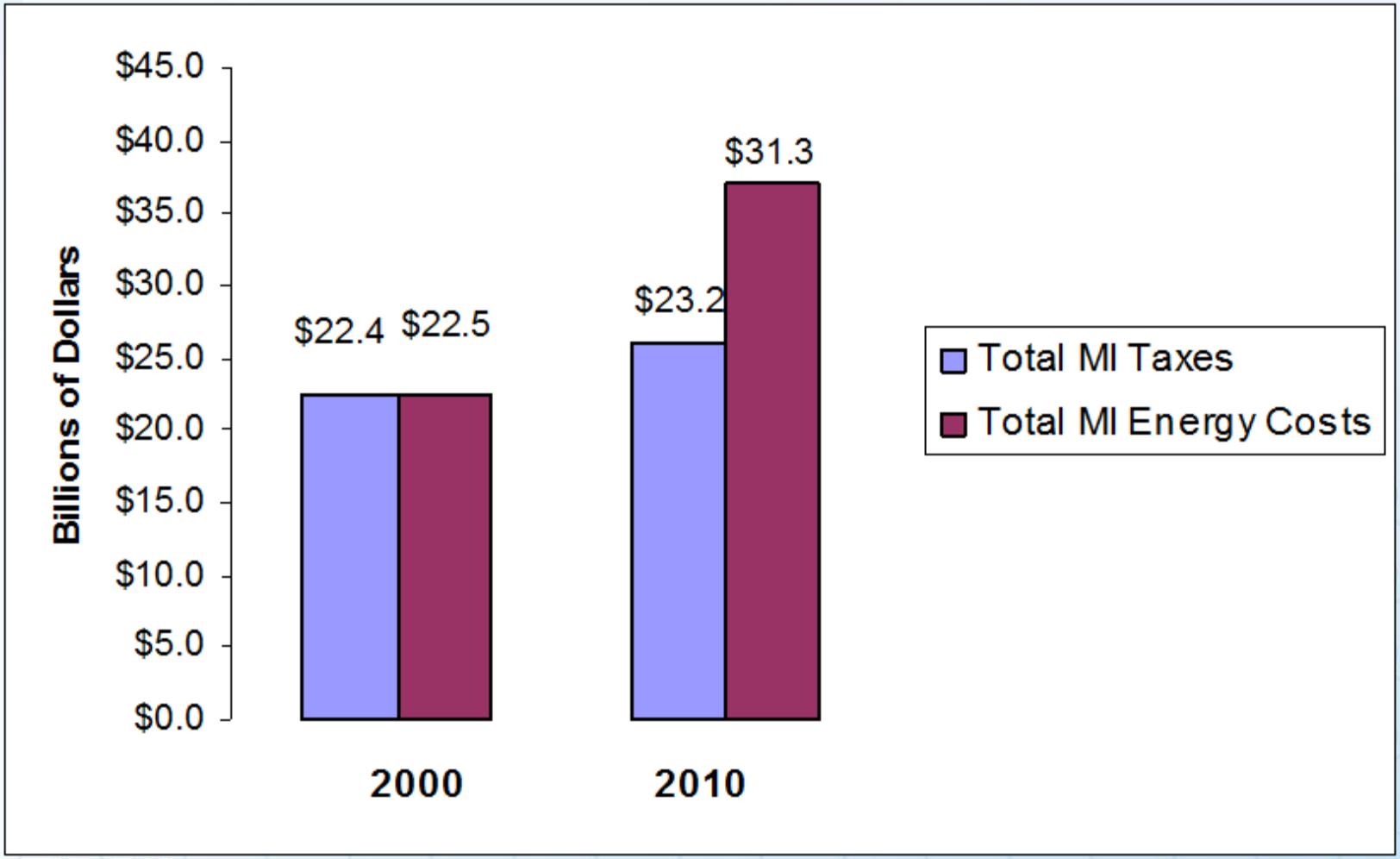
Total Michigan Taxes vs. Michigan Energy Costs 2000 vs. 2010

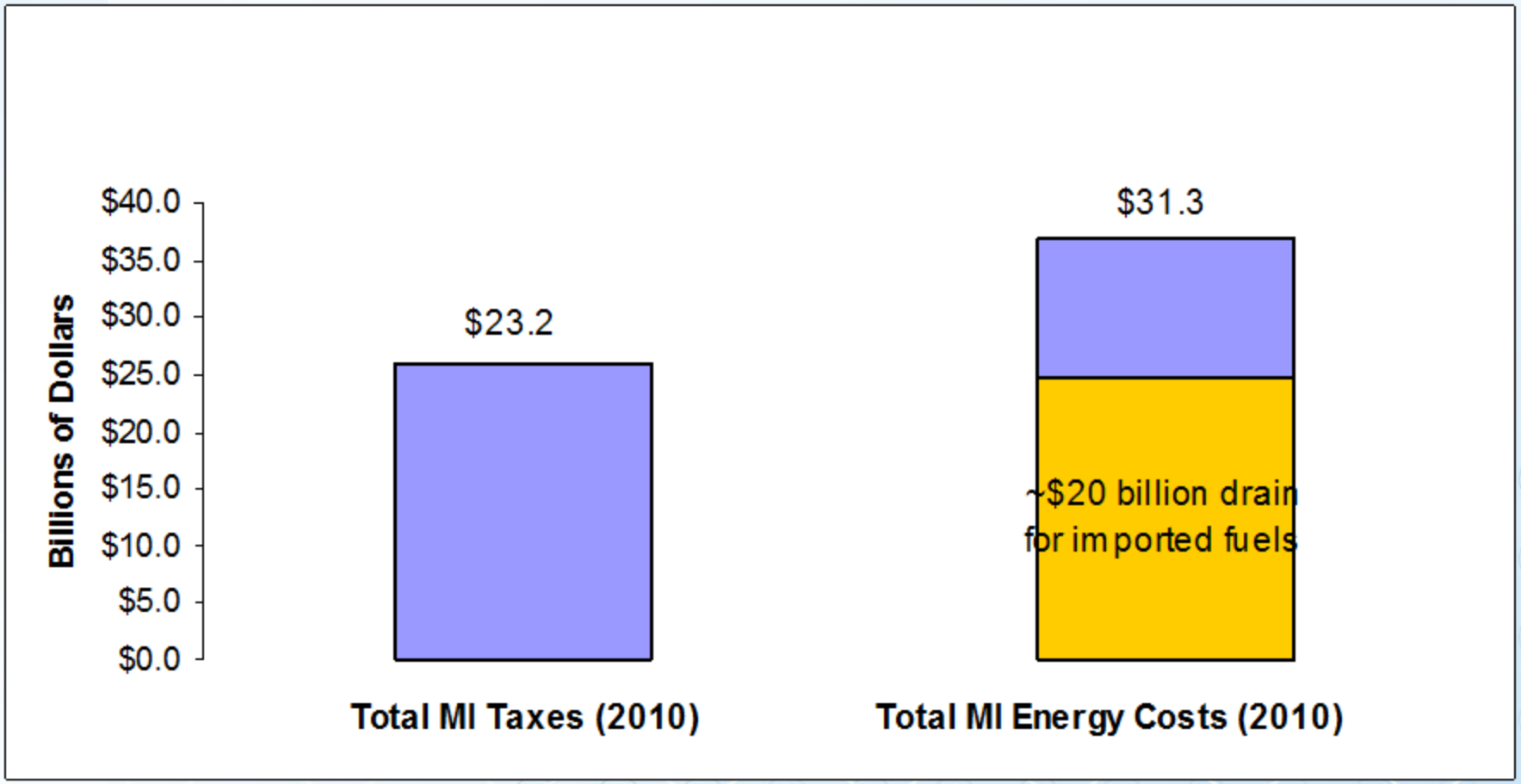


COST OF MICHIGAN'S ENERGY IMPORTS

- Before the new 'high energy cost' era (circa 2000), roughly $12 billion per year was leaving Michigan to pay for fuel imports
- **At 2010 market prices, this dollar outflow was over $20 billion per year**

THIS IS A HUGE ECONOMIC DRAIN ON OUR STATE ECONOMY!

Economic Burden on Michigan Homes and Businesses: Taxes vs. Energy Costs (2010)



EFFECTS ON THE STATE ECONOMY

This **additional $8 billion** annual drain on Michigan's economy is roughly equivalent to the lost payroll from **closing 160 major manufacturing plants**.

(assumes 1000 jobs @ $50,000 each, per plant)

Even the Wall Street Journal has written about the unprecedented transfer of wealth, calling it a "bonanza" and "windfall" for the handful of big energy producing states (i.e., AK, NM, ND, WY and TX) and countries (e.g., OPEC).

KEY POINT #2:

MICHIGAN'S FUTURE IS **NOT** IN FOSSIL FUELS

MICHIGAN'S RECOVERABLE RESERVES AS A SHARE OF U.S. RECOVERABLE RESERVES (Source: U.S. EIA)

- Coal: 0%
- Uranium: 0%
- Oil: 0.2%
- Natural Gas: 1.0%

Why would Michigan support policies that encourage greater consumption of these resources?

(At the state OR federal level)

MICHIGAN NEEDS TO EMPHASIZE:

- Energy Efficiency
- Michigan-based Renewable Energy

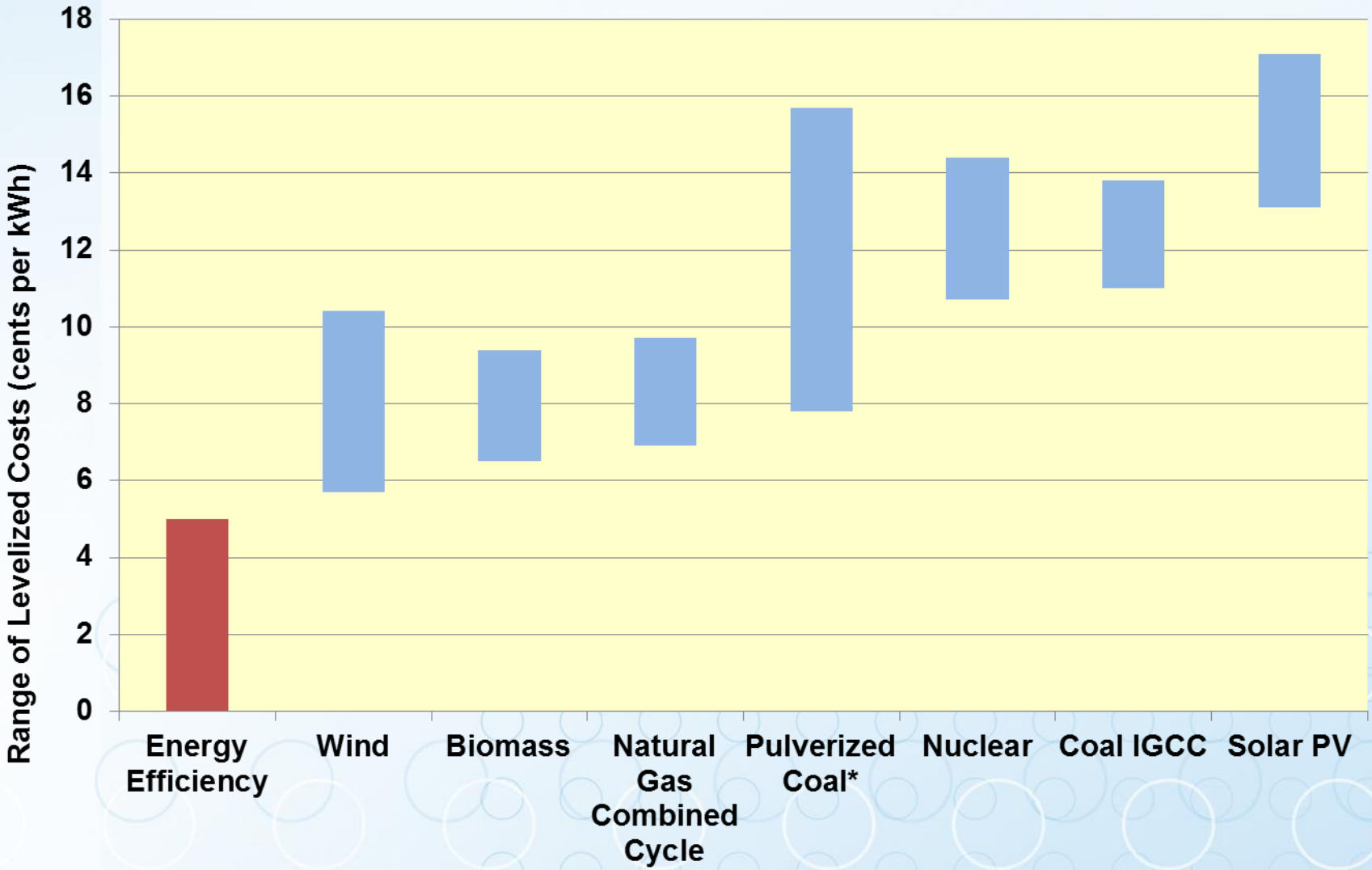
KEY POINT #3

It is much cheaper to save energy than it is to produce it.

[We can save electricity for about one-third the cost of producing it through a new power plant

…. With no carbon (CO_2) emissions]

COST COMPARISON OF ELECTRICITY RESOURCE OPTIONS



*Notes: All data from Lazard , Inc. *Levelized Cost of Energy Analysis,* 2012.

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DATA FROM THE MICHIGAN PUBLIC SERVICE COMMISSION*

Cost of different electricity resources

- Energy Efficiency: **2.0** cents/kWh**
- New gas combined cycle plant: **6.6** cents/kWh
- New coal-fired power plant: **11.1** Cents/kWh
- Current weighted average of power supply costs in Michigan, including purchased power: **6.4** Cents/kWh (excluding transmission costs)***

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* *2012 Report on the implementation of P.A. 295 Utility Energy Optimization Programs*, November 30, 2012

** Statewide average levelized cost of energy savings from Energy Optimization programs

*** *Report on the implementation of the PA 295 Renewable Energy Standard and the Cost-Effectiveness of the Energy Standards*, MPSC 2013

KEY POINT #4

Experience since 2008 shows

that Energy Efficiency is already working

From PA295, Section 71:

"*The overall goal of an energy optimization plan shall be to reduce the future costs of provider service to customers. In particular, an EO plan shall be designed to delay the need for constructing new electric generating facilities and thereby protect consumers from incurring the costs of such construction.*"

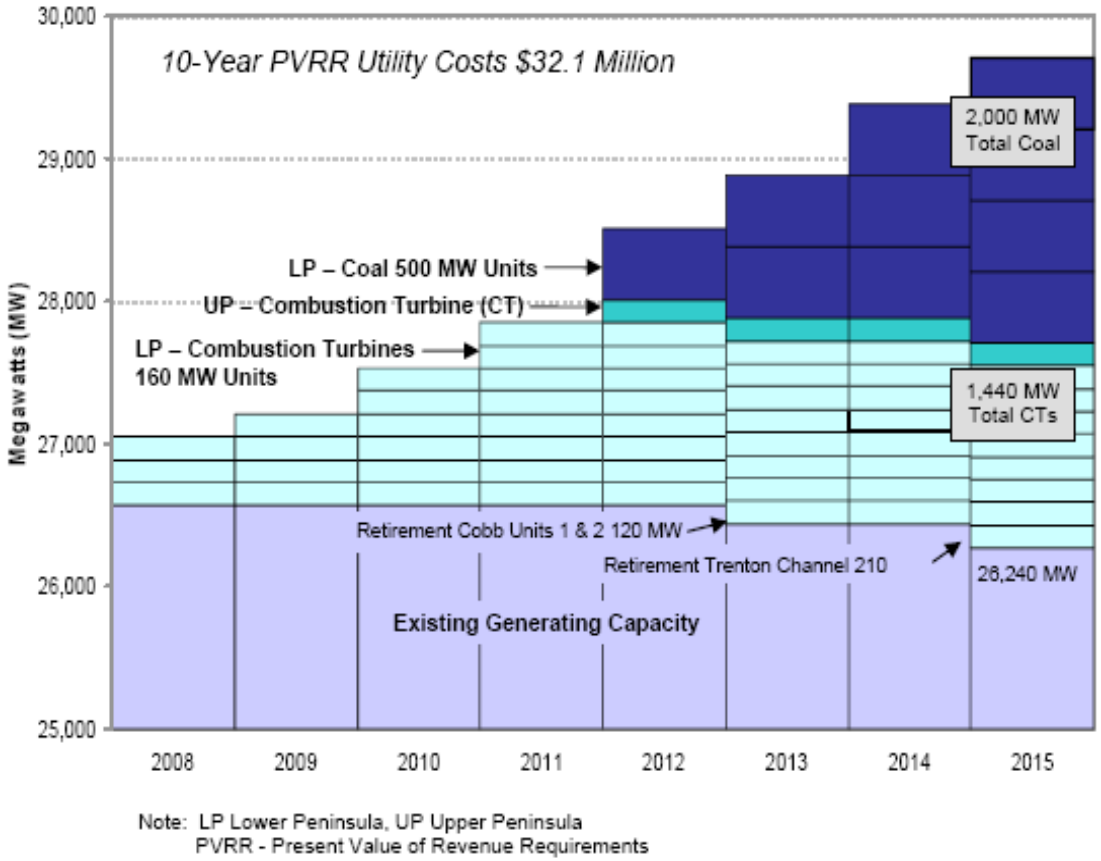
From Michigan 21st Century Plan

(http://www.dleg.state.mi.us/mpsc/electric/capacity/energyplan/index.htm)

Central Station Generation Scenario (Appendix I, p.6)

(represented "business as usual" in 2007)

Figure 4: Schedule of Cumulative Generation Additions for the Central Station Scenario



Note: LP Lower Peninsula, UP Upper Peninsula
PVRR - Present Value of Revenue Requirements

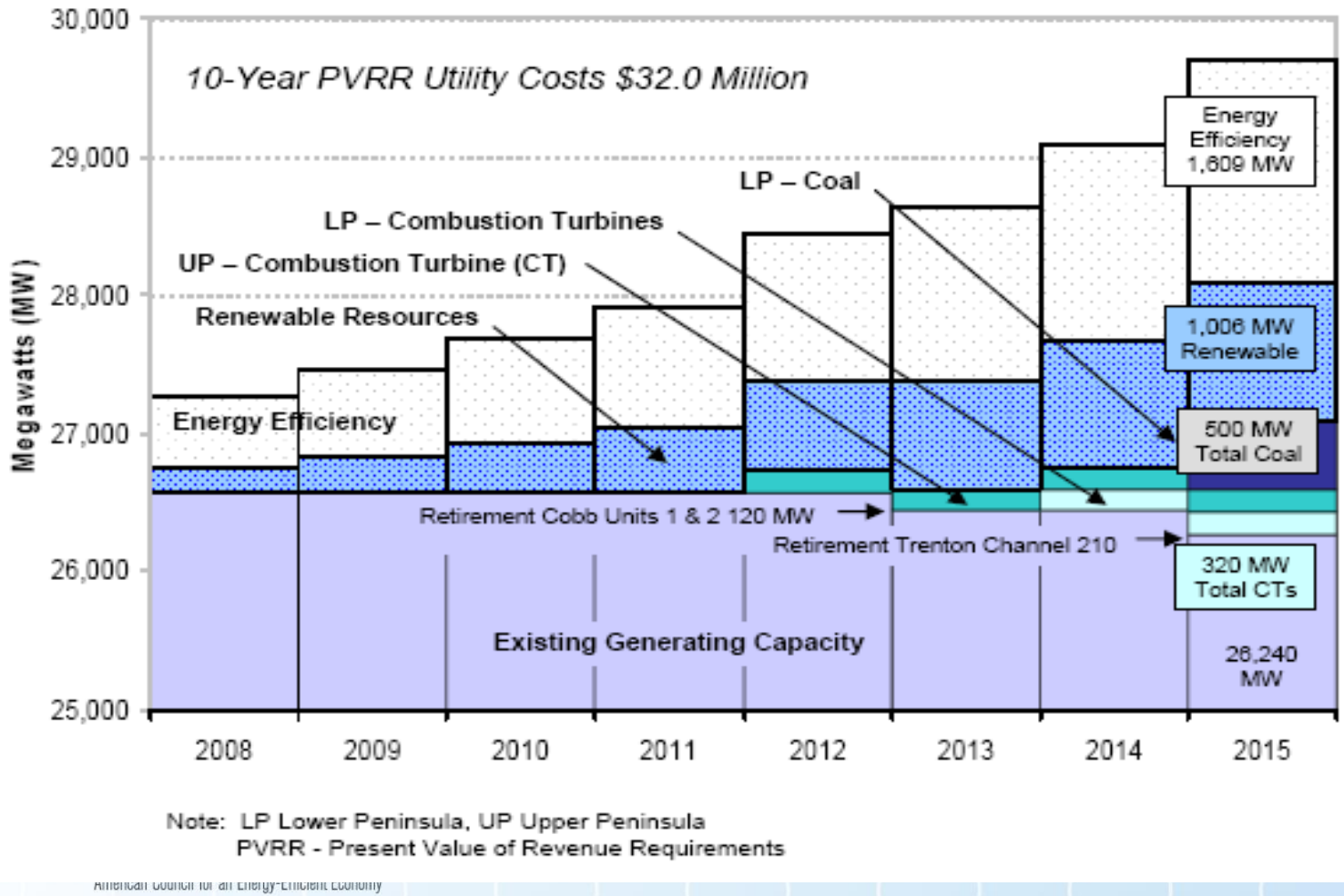
Coal: 10 cents/ kWh + carbon

nat gas 8-9 cents/ kWh or 8-9 cents/ for purch. power

From Michigan 21st Century Plan: Energy Efficiency & Renewable Energy Scenario

(Appendix I, p.7)

Figure 5: Schedule of Cumulative Generation Additions for the Energy Efficiency with Renewable Energy Scenario



Note: LP Lower Peninsula, UP Upper Peninsula
PVRR - Present Value of Revenue Requirements

Energy Efficiency 3 cents/ kWh (no carbon)

Wind 7-8 cents/ kWh (no carbon)

A little gas or purch. power

MI 21ST CENTURY PLAN CONCLUSIONS

"modeling for the Plan showed that, **in the absence of any energy efficiency programming**, Michigan would need no fewer than four new 500 MW baseload units by 2015 to meet forecasted demand. **With energy efficiency programming**, the model decreased the forecasted need to two new baseload units on a staggered basis; and with the addition of the RPS, this projection has been decreased further to one new unit by 2015."

"By displacing traditional fossil fuel energy, **the energy efficiency program alone could save Michigan $3 billion in electricity costs over the next 20 years**. These results compare favorably to other statewide energy efficiency programs."

Michigan's 21st Century Electric Energy Plan, pp. 32-33

The Michigan 21st Century Electric Energy Plan of 2007 helped lead directly to the passage of PA 295 in 2008….
…..which created for the ***first time*** in Michigan:

1. A requirement for utility energy efficiency programs, including annual energy savings requirements; and
2. A renewable energy portfolio standard, requiring 10% renewable electricity by 2015

Essentially, Michigan has followed that "Energy Efficiency and Renewable Energy" scenario from the 21st Century Plan….and avoided billions of dollars of costs for new electricity generating plants….just as the 21st Century Plan predicted.

Congratulations to Michigan policymakers!

From Michigan 21st Century Plan: Energy Efficiency & Renewable Energy Scenario

(Appendix I, p.7)

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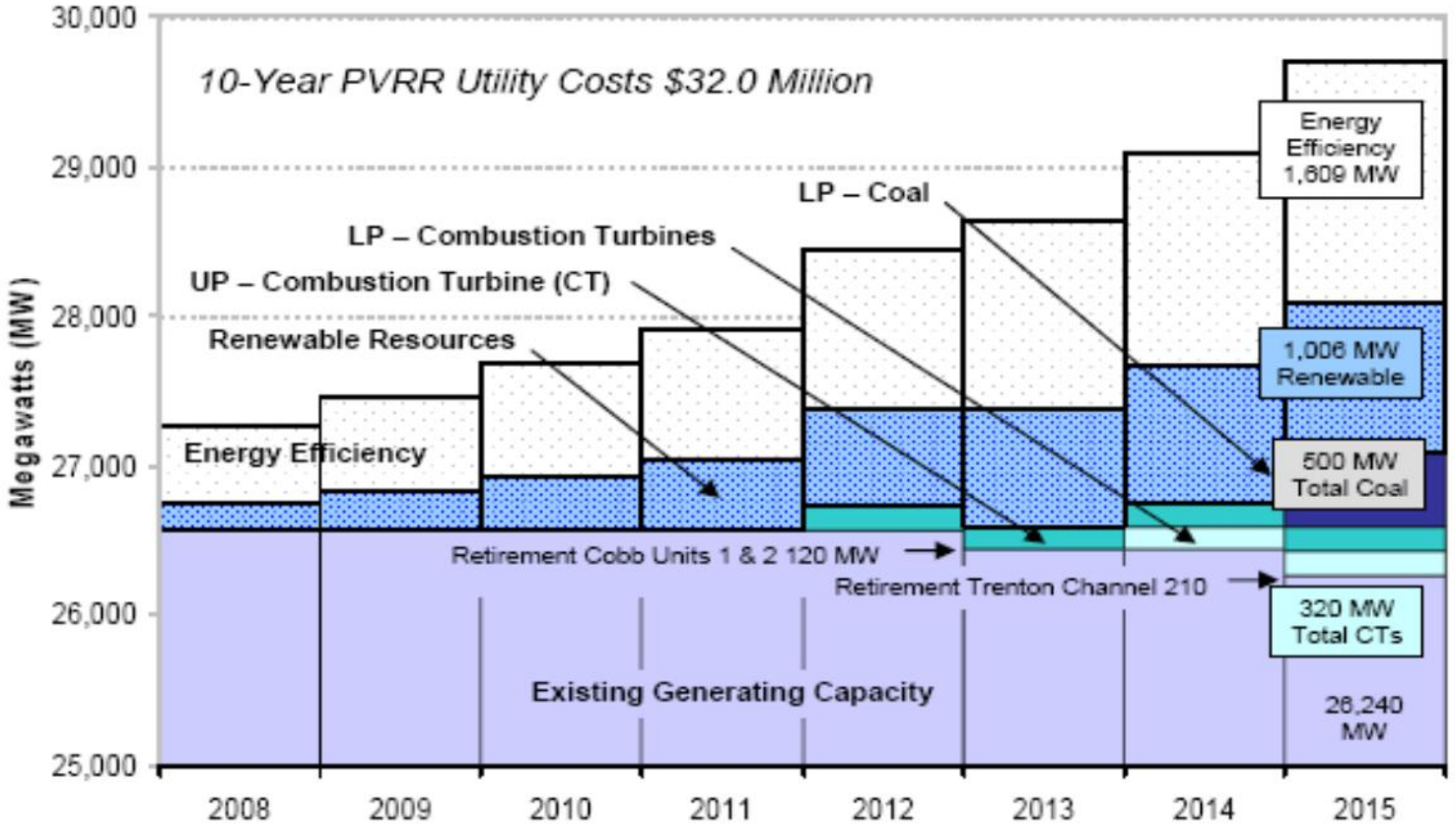

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IF THE MPSC 21ST CENTURY PLAN ANALYSIS WAS REPEATED NOW:

- Coal plants wouldn't be selected at all
  - Load growth is virtually flat
  - Coal costs now are over 10 cents/kWh (vs. 6 cents in original study)
- Energy Efficiency still by far the first priority
- Renewables and natural gas would fill in the remaining need

KEY POINT #5: MICHIGAN HAS ENORMOUS REMAINING POTENTIAL FOR ENERGY EFFICIENCY

- Michigan's building stock is relatively old and inefficient (much constructed prior to advanced energy building codes)
- Recent data on existing buildings and equipment stock in Michigan shows huge need for efficiency improvements
- Other state studies on energy efficiency potential show large remaining potential…. even in states that have been doing utility energy efficiency programs for decades

MICHIGAN'S BUILDING AND EQUIPMENT STOCK IS RELATIVELY OLD AND INEFFICIENT

Residential

- Two-thirds of residential dwellings in Michigan were built prior to 1980 - - in the era before there were any energy codes in place in Michigan

http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_11_5YR_B25034&prodType=table

Commercial

- 7 out of 10 commercial buildings in Michigan were built before 1990 - - meaning nearly all were built before Michigan implemented the relatively modest ASHRAE 1980 standard in 1986 (standard has been upgraded several times since)

https://www.michigan.gov/documents/mpsc/Michigan_Commercial_Baseline_Study_367665_7.pdf

DATA ARE AVAILABLE ON THE RELATIVELY INEFFICIENT BUILDING AND EQUIPMENT STOCK IN MICHIGAN

- *Michigan Baseline Study 2011: Residential Baseline Report*
  MPSC, 2011
  www.michigan.gov/documents/mpsc/Michigan_Residential_Baseline_Study_367668_7.pdf

- *Michigan Baseline Study 2011: Commercial Baseline Report*
  MPSC, 2011
  https://www.michigan.gov/documents/mpsc/Michigan_Commercial_Baseline_Study_367665_7.pdf

EXAMPLES OF RESIDENTIAL ENERGY EFFICIENCY NEEDS IN MICHIGAN, FROM THE 2011 MPSC REPORT

- 40% of homes still don't have high-efficiency showerheads
- 82% don't have pipe insulation on hot water pipes
- 93% don't have water heater insulation wraps
- A fourth of all homes still have no CFL lightbulbs
- 3/4s of homes with crawl spaces or unfinished basements had no floor insulation or crawl space/basement wall insulation
- Nearly 30% of homes had no rim joist insulation
- Nearly 30% with finished basements had no basement wall insulation
- Over one-fourth of homes still have single-pane windows
- Nearly one-fifth of homes have heating systems over 20 years old, and 61% of homes "never" have their heating system tuned
- Over half of central air conditioners are over 10 years old (one-sixth are over 20 yrs old), and 56% of households "never" have a tune-up
- Less than half (44%) of homes had programmable thermostats
- Only 14% of washing machines were "Energy Star" qualified
- One-fourth of homes still have operating second refrigerators

EXAMPLES OF COMMERCIAL ENERGY EFFICIENCY NEEDS IN MICHIGAN, FROM THE 2011 MPSC REPORT

- Nearly 30% of commercial buildings have no wall insulation
- Nearly half (49%) have roof insulation with R-value of R-12 or less
- 29% have single-glazed windows
- 90% have at least some inefficient T-12 lighting
- Less than 5% have the high-efficiency “Super T-8” or T-5
- 90% of do not have automated lighting controls
- Nearly a third still have incandescent exit sign lighting
- Only 18% of buildings with unitary HVAC systems have automated controls
- Less than one-fourth of buildings with air handlers have ‘variable air volume” (high efficiency) units
- Less than a quarter (24%) of buildings with boilers have programmable thermostats or energy management systems
- Less than 10% of buildings with commercial refrigeration equipment have high efficiency measures such as heat recovery systems, high efficiency evaporator fans or floating head pressure controls

CONCLUSIONS

- **Energy efficiency** has been, and continues to be, Michigan's **cheapest energy resource by far** (one-third or less the cost of any other generation supply option); and has already helped Michigan ratepayers avoid billions of dollars in new electric generation costs.
- Michigan's building and equipment stock tends to be older and inefficient, in both the residential and business sectors; and **there is an enormous amount of remaining need for energy efficiency improvement.**